Notebook Series -- Notebooks by Experimenters Other Than Edison
Chemical Experiments -- L. F. Ott Books
Notebook, N-13-10-05

This notebook was used by Ludwig F. (Louis) Ott during October 1913-July 1914 for notes on various chemical experiments. Most of the experiments relate to batteries. Included are notes on the recovery of nickel flake and black oxide from old battery tubes, preparation of iron oxide for the batteries, and fireproof paint for the Edison Chemical Works at Silver Lake, New Jersey. There are also experiments pertaining to Blue Amberol cylinder records and to other phonograph-related items, including waxes and varnishes. Some of the notes are partially in German. The last page is an index to the experiments. The index has been filmed first. The front cover is labeled "Notebook." The book contains 124 numbered pages, some of which are blank, followed by approximately 10 unnumbered pages.

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56700

Acme Co.,

MFG. STATIONERS,
96 JOHN ST.
AND
19 PLATT ST.
NEW YORK.

From Oct 5, 1913.
Ludwig F. Ott

Oct. 5, 1913

1

Experiment to value [illegible]
Blue as Black for Blue [illegible]

Mixing [illegible] [illegible]

Proportion [illegible]
31 g [illegible] 4 [illegible]

#1 Plaster 17 g Water 12 cc [illegible]
. 1 of Black [illegible]
#2 Same as #1 weight added 5 [illegible] sol
"Deptrine. 1 of Blue [illegible]

2a Same as #1 weight added [illegible]
[illegible] glue [illegible]

All from 3 to 21 incl. [illegible]
Plaster 17 g Water 12 cc [illegible]
X [illegible]

X 3 Violet Base
X 4 Sol Prussian Blue
X 5 Nigrosine W. E
X 6 Alkali Blue 3. R.
X 7 Alkali Blue C. I.
X 8 Nigrosine E. H.
X 9 Blue B. Alc. Sol.
X 10 Victoria Blue Base

11 Methyl Blue B.B.
12 Cotton Blue S.B.X
13 Fast Blue
14 Sulfitol Blue M.S. Conc.
15 Vat Blue A. Conc. OK.
16 Pyro Black K, B.P.X. Conc
17 Oxidized Blue H.R.
18 Blue R.R.
19 Methyl Blue B.B.X.
20 P-Blue B.H.X.
21 Blue B.B.
22 Same as #4 except 1g Dye
23 " " " " 2g Dye
24 6cc Conc Sol Acid Tannic + 6cc Sol $FeCl_6$
25 1g Acid Tannic + 2cc Sol $FeCl_6$
26 2g Ultramarine
27 1g Chinese Blue
28 Same as #4 but 1/4g Prussian Blue Sol
29 " " " " 1/2g " "
30 " " " " 3/4g " "
31 " " " " 1g " "
32 " " " " 1 1/4 " " "
33 " " " " 1 1/2 " "
34 " " " " 1 3/4 " "
35 " " " " 2 " "
36 " " " " 2 1/4 " "
37 " " " " 2 1/2 " "

#24 Fe_2Cl_6 was mixed with the plaster keeping it almost saturated without settling. Then added the Tannic Acid

25 Tannic Acid 4 grs dissolved with plaster then added the Fe_2Cl_6 in 2 cc H_2O

26-27 [illegible]

28 to 39 incl Sol. Prussian Blue Dissolved in the water.

40-41 incl Sol. Prussian Blue mixed in the casserole with the Plaster with a spatula.

46-47 Ambient Blacks set in water painted on with the fingers.

55-62 incl the colors were ground in with Castor oil and then applied a drame with a [illegible]

38 Same as #4 except 2 3/4 g Prussian B
39 " " #4 " 3 g "
40 " " #31 } see note Page
41 " " #35 }
42 Blank
43 Blank.
44 4g Prec. Copper Oxide from Metall by HCl + Bromine. Too Brown and weakens the plaster
45 Drawing inks rubbed on a block with the finger.
46 Diazo Black K.D.X is K.B.X. Pa
47 Nigrosine B.B Painted on
48 Same as 46 except added a little Gum Dra
49 " " 47 " " " " "
50 Painted with ordinary writing inks.
51 2g Black from Sugar + HCl.
52 1g Fresh Prussian Blue,
53 2g " " " ,
54 3g " " " ,
55 Oil Black P247 Painted On H & Merz
56 Oil Black N484 Berlin Aniline Works
57 Oil Blue #B 2559 H + Merz.
58 Jet Black Fat Color #H 526 Berlin Aniline
59 Dead Black Fat Color Berlin Aniline Works
60 Nigrosine Fat Color #60970 " " "

Oil Black #8603 H + Merz
(2) Oil Black Ps Manne.
3 #28 One side Linseed Oil Rubbed in the other side Chinese Wood Oil Rubbed in,
4 #39 with Linseed Oil Rubbed in
5 Drop. Black 4g.
6 1% sol of ~~Hy~~ Diazo Black K.D.X Dissolved in water with 1/8 of 1% Turpentine sprayed on.
7 #29 Varnished with a solution of 1/2 glycerine 1/2 water

The Drop Black when dried then rubbed over with any oil or a solution of Glycerine + Water gets jet Black. I find this to be the case with all the dyes (aniline) and also the Prussian Blue.

I also tried from samples using 1g Prussian Blue in Plaster ~~+5cc H2O~~ +15cc of Glycerine Sol.

1/1 = 1% Glycerine
1/5 = 5% "
1/10 = 10% "
1/15 = 15% "
} All wetted the Plaster

The more glycerine added the darker the color after drying (Bunsen flame = Keeping the surface moist because glycerine will not dry out) But the more glycerine the weaker the Plaster.

72 Indigo heated cold with conc H_2SO_4 then filtered washed with water until it become soluble ~

73 Indigo treated with H_2SO_4 warm, then ~~filtered~~ diluted with water filtered and the free. and added just enough NaOH to Neutralize the acid used

74 Same as 73 except did not neutralize

75 Filtrate from 73

The following spraying solutions tried

76 1% Sol. of B.R. Resin in Alcohol + 1/10% ~~of Blue B Alcohol Sol.~~ Nigrosin W.F.

77 Same as above except. 5% Resin.

77a " " 77 + 1/10% Blue Dye

78 1% Sol. of Shellac in Alcohol + 1/10% ~~Blue B. Alc. Sol.~~ Nigrosin W.F.

79 Same as 78 except. 5% Shellac.

80 1% Sol Dextrine in water +

81

82

83

84 A sol. for spraying the records in 1500 cc Denatured Alcohol. are dissolved 15g Nigrosine W.E. & 15g. Nigrosine 2/B Base. + 75g Phenol Resin.
raised Phenol Resin to 150g

85 1/2g Acid Indigodisulfonic + 15g Plaster.

86 1g " " + " " "

87 1½g " " + " " .

88 1/2g Indigo Carmine + " "

89 1g " " + " "

90 1½g " " + " "

Experiment on extracting or purifying Waxes. Mexican Candilla Beeswax Japan Wax

Solubility of Candilla Wax

Solvent	Candilla	Bees	Japan	
Ether	Sol X	Sol X		
Chloroform	Sol	Sol		
Alcohol	Sol X Hot.	Sol X Hot.		
CCl4	Sol.	Sol		
Benzole	Sol	Sol		
~~Toluene~~				
Mono chlor				
di chlor				
tri "				
tetra "				
penta "				
Naphtha				
S_2	Sol.	Sol.		

X = Partly sol.

Candillera Wax is nearly all sol. in Hot alcohol some remains undissolved while on cooling some crystallizes out while some remains dissolved in the cold alcohol.

Beeswax. Hot alcohol dissolves part of the beeswax which upon cooling a precipitate forms while the remainder of the alcohol also contains some wax after filtering and evaporating the alcohol

92 Myricin from Beeswax Insol in hot alcohol.

93 Cerin from Beeswax sol in hot alcohol and crystallized out on cooling

94 ~~Cerin~~ Left in the mother liquor from crystallization of the Cerin 1st ppt

95 Alcohol distilled off from mother liquor.

92 a Myricin from 2nd crystallization of the Cerin

94 a Same as 94 Except from 2nd crystallization

(92) Total	313.50		(92a) Total	55.00	
Dish	188.00		Dish	35.00	
	125.50			20.00	
93 Total	47.00		94 Total	110.50	
Dish	36.50		Dish	88.00	
	10.50			22.50	
94a Total	155.00				
Dish	150.00				
	5.00				

Mr. Edison Exp. #91

Dear Sir: Herewith please find a description of the products from Beeswax extracted with hot alcohol.

00 grams Beeswax was extracted with 800cc denatured alcohol on the steam bath using a condenser. Time of boiling 1 hour then the dissolved portion was poured off from the undissolved part and this repeated 5 times using a total of 000cc alcohol. The residue which remained after the 5th extraction is marked #92 and is known as Myracin.

The portion which was dissolved in the hot alcohol was left to crystallize and the mother liquor filtered off as good as possible.

The mother liquor was then put in a retort and the alcohol distilled off this left the oily residue marked #94.

The part which crystallized out of the hot alcohol and known as Cerin was dissolved in hot alcohol for a second crystallization, but did not all dissolve leaving a residue marked 92a; as it probably is some of the Myracin which came over in pouring off the hot alcohol in the extraction process.

The mother liquor from the second crystallization was put in a retort alcohol distilled off and left the residue marked #94a.

#93 is the Resin or the part sol in the hot alcohol which crystallizes out.

The first crystallization of the Resin is easily washed or filtered. while the 2nd is filtered with difficulty necessitating the distilling off of about 1/2 of the alcoholic mother liquor.

The oily substance is probably the volatile oils of the resinous which dissolve in the alcohol and do not crystallize out upon cooling.

Summary.

Taken 200 g.

#93 or the Resin (part crystallizing out of hot alcohol)	10.50 g
#94 Oily substance left after distilling mother liquor from first crystallization	22.50 g
#94a Oily substance left after distilling off mother liquor 2nd crystallization	5.00
#92 Myricin Insoluble part.	125.50
#92a Myricin left insol on making the 2nd crystallization of Resin	2000
	183.50
Loss	17.50
	200.

The loss is due to some remaining on the filter and so on.

L. Ott.

Expt. #91

Candelilla Wax

Extracted the same as the Beeswax.

95 Candelilla left undissolved after fifth extraction with hot alcohol. 98 grams

96 Part which crystallizes out of the alcohol. 44 g

97 Part which remained undissolved in making the 2nd crystallization.

98 Part which remains dissolved in the alcohol 1st cryst.

99 Part which remains dissolved in the alcohol 2nd cryst.

95	98 g	200
96	44 g	187
97	10 g	13 g loss.
98	27	
99	8 g	
	187	

Japan Wax

100 · Part insol in hot alcohol after 5 hr extraction 55g

101 Part left insol in making 2nd cryst. 52g

102 Part sol in alcohol from 1st cryst. 44g

103 Part sol in alcohol from 2nd cryst 12g

104 Part crystallizing out of the hot alcohol 22g

Exp. [illegible] Jan. 1, 1914

[illegible] Oxide

106

16 —

108

109

110

111

$FeSO_4 + Na_2SO_4 + 2NaOH$

304 grams of Anhydrous Ferrous Sulphate from Silver Lake + 284 grams of Glauber Salt made anhydrous (from Silver Lake) + 160 grams of NaOH (Primary Battery Soda) were all mixed together put in a sand crucible and heated to the fusing point and kept there 1/2 hour in covered crucible, then cooled, cracked out of the crucible with a hammer and the melt dissolved in boiling water about 3 liters let stand and the clear liquid decanted off this was repeated 3 times after which it was

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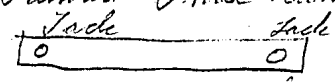
Experiment # 112

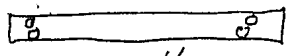
Testing Fire Proof Paint (for indoor work) made by H.W. Johns Paint Mfg. Co Newark N.J.

Painted Three Cards

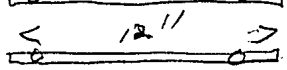


= One coat.

Marked with tacks.



Two coats



Marked on edge

This was not painted on one edge.

Three more Slats coated as follows

1/2	Sodium Silicate	1/2	water	one coat	}	Sp.G.
1/2	" "	1/2	"	2 coats		
2/3	" "	1/3	"	one coat	}	Sp.G.
2/3	" "	1/3	"	2 coats		

Sodium Silicate Sp.G. 1415

The slat coated with first Sodium Silicate 1415 Sp.G. was best.

1 sq. foot requires 30 g Solution

$\frac{453}{30}$ = 15 sq ft. per lb @ 01 1/2 ¢ per lb from Chas. Cooper in 100 lots.

continued page 22

put on a suction filter and washed with 1 liter hot water, then dried 6 inches above the hot plate. After drying it was screened through 60 mesh and bottled.

Dissolving with HCl and boiling gave no precip by passing the gases into Lead Acetate Solution.

Fusion with NaOH + KNO_3 dissolving acidulating with HCl. and adding $BaCl_2$ gave no ppte of Sulphates.

℞ 50 grams of Sodium Silicate require 5g of Florence White Lead Brand Zinc Oxide from N. J. Zinc Company.
or 4.5 grams per lb —
or 10 lbs Sodium Silicate require 1 lb. Zinc Oxide 125 sq feet
Na Silicate lb — .02 for 28 cents
Zinc Oxide lb. — .08
.10

Exp. #113 Feb. 7/19

Mixes for taking second impression.

#114	18g	Sawdust mixture	+	5g ZnO
115	18g	"	+	10 " "
116	18g	"	+	15 " "
117	18g	"	+	20 " "
118	18g	"	+	25 " "
119	18g	"	+	30 " "

Feb. 17 — Feb. 17, 14.

Ground up Iron from old pockets screened thru 120 mesh all fines in and sent to Silver Lake to pick up Ex Pockets

14549		14550	
.1V	1/2 V	1V	1/2 V
1100		910	
1200		870	

Second Lot same as above to be loaded for Lowrie pockets.

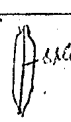
Experiment #120 Feb. 11/14

Recovery of Nickel Flake & Ni Hydrate from old used pockets.

The round pieces to be put in a glass vessel with water and excess of any K or Na salt added let stand 4 days and see if it disintegrates.

#1	K. Carbonate	Color	Stands 10 Days	24 hrs
2	" Bicarbonate			nearly disintegrated
3	" Oxalate	Green 5 hrs		
4	" Perchlorate	Do	~~5 hrs~~	Disintegrate
5	" Arsenite			
6	" Benzoate			
7	" Chlorate			
8	" Sulphite	Green 5 hrs	5 hrs	disintegrate
9	" Cyanide	Yellow 5 minutes	5 minutes	Disintegrated
10	" Phosphate			
11	Hydrosulphate	5 min	5 min	Plates ok.

12–19 on 10.30 a.m. 14/14, Saturday
20–39 on Tuesday 17 at 9.00 AM
40–53 incl on Wed. at 1.00 P.M.
54–112 on 1.00 P.M. Tuesday Feb. 24/14

O = Fried on Split Tubes 

#1 K. Carbonate O Partial Disintegration on shaking in 24 hrs

#2 K. Bichromate O Slightly disintegrated in 24 hrs Comp. dis. Sun 11.30 AM No Nickel Dissolved

#3 K. Oxalate O Solution shows a green color in about 1/2 hour. not disintegrated Complet dis Sun 11.30 AM Very much Nickel dissolved —

#4 K. Perchlorate not attacked or disintegrated by Green Sol

#5 K Arsenite O some Ni Dissolved Totally disintegrated in 24 hrs. Nearly all the black oxide dissolves, or breaks up in such fine state of division on diluting with water that it passes thru filt

#6 K. Benzoate not attacked or disintegrated

#7 K. Chlorate O not attacked or disintegrated.

#8 K Sulphite O Sol. shows green color in 24 hrs ~~and totally disintegrated~~ partially disintegrated Totally dis 7 Feb. 16, 4. PM Much Nickel dissolved.

#9 K. Cyanide Sol. turns yellow in 10 minutes Totally disintegrated in 24 hrs. Dissolves much Nickel

#10 K. Phosphate not attached or disintegrated

#11 Hydrosulfite (Badische) Totally disintegrated in 24 hrs. Sol Green color reduces sol. to metallic Nickel. By adding more Hydrosulfite to the green sol and boiling all Ni is reduced to metallic Ni?

12 K. Bitartrate O Slight dis - on shaking after 2 hrs Sol. Green in 24 hrs Comp. dis - Sunday 15 11.30 AM A little Nickel dissolved —

13 K. Nitrite O 1/2 disintegrated

14 K Chloride Slight dis - on shaking after 2 hrs Sol - tinge of green. 1/2 Disintegrated

15 K. Al. Sulphate 1/3 disintegrated

16 K Iodide O nearly all dis - after 2 hrs sol Brown Completely Dis - Sunday 15 at 11.30 AM No Ni Dissolved Hard to wash free from Iodide

17 K. Permanganate 0 1/2 disintegrated

18 K. Bisulphate Disintegration commences in 5 min. Nearly all dis in 2 hrs. Sol green in 24 hrs 3/4 disintegrated starts rapidly but slowly.

19 K. Ferrocyanide 0 Nearly all dis - in 2 hrs sol green. Very little Ni Dissolved (Traces)

20 K. Sulphide 0 (dissol in 48 hrs) no nickel dissolved In drying 2 end caps were found in the flake much rusted this caused a few grains of the Ni Oxide to appear yellow

21 K. Manganate

20 to

22 K. Hyposulphite 0 completely disintegrated in 24 hours. no nickel dissolved

23 K. Chromate

24 K. Arsenate

25 K Bromate

26 K. Binoxalate Sol very green

27 K Hypophosphoros 0 On dilution with water gas is evolved (dissol in 48 hrs) much Ni dissolved

28 K Propionate ? Sol Slightly green

29 K. Ferricyanide 3/4 Disintegrated

30 K. Lactate Not Saturated Sol. very green Completely disintegrated in 24 hours great deal of Ni dissolved —

31 K Ethyl Sulphate Not Saturated ~~No Nickel dissolved~~ not all dissolved about 3/4

32 K Persulphate 3/4 dissolved

33 K Ethylsulphonate Tubes covered with brown flocculent coating Brown flocculent Precipitate

34 K barbolate disint in 96 hrs very little Nickel Dissolved

35 K. Formate Not Saturated (Disint in 48 hrs) no nickel dissolved

36 K. Nitrate Sol. Light Green

37 K. bitrate Completely Dis — in 24 hrs Sol Brown great deal of Ni dissolved too much Fumes to [illegible] the glass pipes

38 K. Salicylate Completely disintegrated in 30 hours, On filtering the Ni in filtrate [illegible] a large precipitate which is formed is soluble in a great amount of water and contains some Ni Very different to usual prec. of Salicylic Acid.

39 K. bichlorochromate Smells after chlorine quite strong

40 K. Lactophosphate not saturated Color brown Green – Probably would dissolve if concentrated [illegible] tubes are all soft.

41 K. Sulphite Ethylate not saturated
Half disintegrated

42 K. Metaborate 1/4 disintegrated.

43 K. Sulphocyanate 0, desint 96 hrs
Trace of Ni dissolved

44 K. Ethyl sulphuric 1/2 disintegrated

45 K Percarbonate 1/2 disintegrated

46 Seignette Salts 0 Light Blue Precipitate
Some Nickel dissolved gets very cloudy filtered and filters with great difficulty but does not the black nickel remains in suspension therefore most of it is lost.

47 K Bromide 1/2

48 K Valerianate not saturated 1/2

49 K Cyanate
Sol very dark green almost black
great deal of Nickel dissolved.

50 K Formate
Showing some Nickel

51 K Benzene Disulphonate 1/2

52 K Sulphobenzoate. 1/2

53 K Ferric Oxalate 1 Only very little investigated Much ferric Hydroxide formed

5

54 Sodium Carbonate Bi

55 Na. acetate

56 Na Cyanide Sol. very brown dissolves much Nickel

57 $Na_2C_2O_4$ (Oxalate) Sol. light green

58 Na Ammon. Phosphate Sol slightly green Lost in cracked glass

59 Na Hyposulfite O disintegrated in 48 hrs
No Nickel Dissolved

60 Na Bromide Sol light green with N—
a light [illegible] precipitate (Chromate)
1/2 disint

61 Na Arsenate

62 Na Phosphate

63 Na Fluoride O 1/2 disint —

64 Na Sulfite disintegrated in 4 5 hrs
No Nickel Dissolved

65 Na Benzoic

66 Na Carbonate

67 Na Sulfide O 1/4 disint —

68 Na Chloride O + Flocculent Precip Liquor of
Green

69 Na Bisulphate Nearly all disintegration 4 hrs Disintegrated in 5 hrs, but Solution Green no grass!

70 Na Borate 3/4 disintegrated

71 Na Salicylate Sol turns brown [illegible] disintegrated in 1/2 [illegible] Trace is dissolved.

72 Na Nitrite 3/4 disint.

73 Na Phosphite

74 Na Silico Fluoride Flocculent Precip White

75 Na Fluoride

76 Na Biphosphate Sol Slight tinge of green

77 Na Tartrate Sol light green. Flocculent Precip tinge of Green

78 Na Manganate 1/4 disint —

79 Na Chromate

80 Na Stannate

81 Na Sulfocarbonate disintegrated in 1/8 hrs in washing much sulphur deposited Sol deep black filtered black let stand over night on adding water in the morning evaporate very pure much Nickel dissolved all Nickel dissolved not removed

82 Na Peroxide O All dis in 1/8 hr Gases very much Lots of black Note 3% Sol of Hydrogen Peroxide does the same

83 Na Butyric

84 Na Bichromate 1/2 disint —

85 Na Urate Sol slight tinge of green well very little residue 1/4 disint —

86 Na Phosphate (Ordinary)

87 Na Benzene Sulfonate 1/2 disint —

88 Na Phosphotungstate Sol slight tinge of green

89 Na Cinnimate

90 Na Lungstate

91 Na Lactate 0 Sol. Lunge of green
Disint in 48 hrs NH_3 and $NH_3 + (NH_4)_2S$ [illegible]

92 Na Stibic 1/2 disint

93 Na Boro Benzoate

94 Na + Mag. Tartrate 0 Sol. Lunge of
green Sol. not very sol. 3/4 disint

95 Na Sulph Anilate 0 disint. in 48 hrs
No ppt dissolved

96 Na Sulbenzoate 1/4 disint
not very soluble

97 Na Cholcate

98 Na Valerianate

99 Na Sulfo ethylate Sol very green disint. in 48 hrs

100 Na Aluminate

101 Na Sulfovinate

102 Na Bi Borate 1/2 disint —

103 Na & K Sulfate Disint 96 hrs
No Ni Dissolved

104 Na Bitartrate Sol very green disint in 48 hrs

105 Na Ferrocyanide Sol shows tinge of green in the yellow — disint. in 48 hrs
some Ni Dissolved

106 Na Tannate

107 Na Tetra oxalate Sol very green Disint 96 hrs
much Ni Dissolved

108 Na Persulfate ~~Slight tinge of green~~
Quite green Disint 96 hrs
much Ni Dissolved

109 Na Bismuthate

110 Na Bromate disint. 96 hrs

no Ni dissolved

111 Na Glycerophosphate disint. in 48 hrs

not saturated

112 Na Bromate 1/2 ohs —

113 Hydrogen Peroxide

Duplicated the Following Numbers

#2 K. Bichromate took 72 hrs (over)
#16 K. Iodide took 72 hrs.
#19 K. Ferrocyanide took over 72 hrs.
#20 K. Sulfide took 72 hrs.
#22 K. Hyposulfite took 72 hrs.
#27 K. Hypophosphites took 36 hrs ✓
#43 K. Sulfocyanate took 72 hrs.
#59 Na. Hyposulfite took 36 hrs. note } Page
#64 Na. Sulfite took 36 hrs. note } 51
#82 Na. Peroxide took over 72 hrs.
#95 Na Sulfanilate took 72 hrs.
#71 Na Selenate took 72 hrs
#113 H_2O_2 took 24 hrs.

Remarks.

#16. K.I. immediately turns brown on putting in the Nickel Material.
#95. Na Sulfanilate also turns brown.
#43 K. Sulfocyanate goes for a few minutes temp rises from 70°F. to 125°F.
#22 K. Hyposulfite goes for a few minutes temp rises from 70°F. to 105°F.
#59 Na Hyposulfite no rise in temperature as in the K. salt.
#82 Na. Peroxide great gassing temp. rises from 70°F. to 140°F.

113 H_2O_2 too expensive it requires about 600 cc of 3% H_2O_2 for 50g H_2O_2 cost 50¢ per gal.

#11 No Nickel dissolved hard to wash
#15 No Nickel dissolved hard to wash
#43 Trace of Ni.
#22 No Nickel dissolved
#20 Trace of Ni Dissolved
#27 Some Nickel dissolved and some of the Black changed to a slimy green. probably a Nickel Phosphate or Phosphite —
#16 No Nickel dissolved very hard to wash free of Lodide.

As the Hypo-sulfite of Soda and the Sulfite of Soda did the stunt in 36 hrs. and cost the least. I took these two as the best.
Therefore putting them through the following test.
50g Material ~~dissolved in~~ were put into 100 grams water saturated with the corresponding Na Salt. Totally disintegrated in 36 hours.

Filtered, tested the filtrate for Nickel in two ways 1st by adding NH_4OH and H_2O_2 converting the sulfite or Hypo into Sulfate then adding $(NH_4)_2S$ no precip. of Ni Sulfide.
2nd crop. to dryness added HNO_3 and HCl, to dryness again, took up with a little HCl and H_2O added $NaOH$ then Bromine, boiled No Nickel as peroxide.

Washed the Material with water until $BaCl_2$ showed no reaction for Sulfates after reducing the Sulfites out to Sulfates as above.

The Material was then tested, a little of the Black Oxide Dissolved in HNO_3 + HCl. H_2O added, Ammonia added and H_2O_2 to oxidize Sulfides Sulfites and Hyposulfites to Sulfates, then acidulated with HCl and added $BaCl_2$, boiled. no prec. of Sulfates this shows that the Black Oxide was not changed to either Sulfides Sulfates Sulfites or Hypo-Sulfites.

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Exp. #121

Exp. to see if the red coating found on old wire from [illegible] found at Sloss [illegible] in a mixture of [illegible] etc.

Time of Stud 12.00
" Finish 1.00
Total time 1 hour
Rev per Min 100
No of Balls 6
Total Weight of material 260g
Then 100 mesh as treating up 12g
" " " after gravity 14g
Gain of 2 grams in time
All broken up then 10 mesh before putting in mill.

2nd time

Same as above except 12 balls.
Loss 22 grams in grinding 3 hours
22
14
36 grams Total Loss going thru
100 mesh

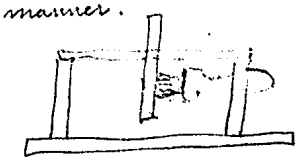
I am now trying the filtered liquid (Sat. Sol of Hyposulphite and the Sat. Sol. of Sulphite of Soda) which was used to ~~dissolve~~ disintegrate the 50 grams material with a few more lumps of the inner part of the Nickel tubes in order to see if it can be used over again.
Time Start. Mar. Thursday 10.00 A.M.
Totally disint in hrs.
2nd time sol. was used.
Na Hyposulphite & Sulphite 20% Sol in 24 hours.

Continued on Page 60

Experiment # 122

Experiment on coating Powder blanks with varnish as per instructions of Mr. Edison in his letter from Florida.

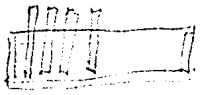
2 records. coated One coat in the following manner.



The record was rotated on a rod as per sketch and the varnish applied with a camels hair brush 3 inches wide while spinning.

N. G.

Dried in the special rack which Mr Edison Mentioned. records standing on edge.

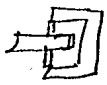


Varnish #632 received Mar. 19, 14.
100 cc of #632 Varnish were diluted with 100 cc Denatured Alcohol from Hoffman this alcohol Sp. G. 0.8157 @ 15°C corresponding to 95 V %

~~Dried in air has been sent to Mr. Moore to take and make Transfers~~

Sent up. 8 Blanks
4 varnished with 1 coat.
4 dis { 1 smoke dried
3 then oven

Image reg. schedule 15 – 500 V 632 – 163
2 coat
OK look good
Dry 1 then oven
" 1 cracks.

Sent to Mr. Moore Saturday April 18/14
12 Powder Blanks Varnished as follows
4 with 2 coats.
4 " 3 coats.
4 " 4 coats.
Varnish # 632 Batch # 185a 100 cc of Varnish + 150 cc of Hoffmans Denatured Alcohol
3 hours time between each coat.
Brush 3" camels hair, used as full of varnish as possible.
Rotated on  horizontal device at 150 Rev. per. min.
All disks left rotating 1 min after varnish was put on.
Left over night before being put in oven.

Exp. # 120

#125	100 cc Water	5g Glycerin	3g Na OH	
#126	" "	10g "	3g " "	
#127	" "	15g "	3g " "	
#128	" "	20g "	3g " "	

50 grams of Material in each case Started April 24, 14 at 8:30 P.M. room Temperature
Nearly all disintegrated in 20 hours

129	100 cc Water	5g Glycerin	3g Na OH		
130	" "	10 "	"	" "	
131	" "	15 "	"	" "	500 grs
132	" "	20 "	"	" "	

50 grams Material in each case on hot plate at 180 °F April 24, 14. at 8:30 P.M. ~~Nearly all disintegrated in 20 hrs. and the Potassium Hydroxide reduced to Sheet~~ Taken off hot plate Monday April 27 at 9. a.m. not all seperated some lumps.

131 duplicate 1000 cc H_2O 150g Glycerin 30g Na OH 500g Material

Duplicate of 131 500g. lot

133 Potassium Hypophosphorus sat. Sol. 100g material. on April 24, 9. P.M. off 9.00 A.M. April 24/14. by April 25 8.00 AM

134 Potassium Sulphide sat. sol. 100g Material. on April 24, 9. P.M. Nearly all disintegrated in 24 hrs (all) 36 off 4/25/ 8.00 A.M.

135 Sodium Salicylate sat. sol. 100g material. on April 24, 9. P.M. Nearly all disintegrated in 24 hrs (all) 36 off 4/25/ 8.00 A.M.

Notes

133 During the night great charcoal action took place boiled over. nearly all disintegrated (what)

131 Duplicate for 500 grams 1000 cc H_2O 150g Glycerin 30g Na OH 500 grams Material on April 27, 5.00 P.M. on Hot Plate. off May 6, 9.30 P.M. Washed by decantation [illegible] but first screened thru 10 mesh screen, that which was left on screen weighed wet 150 grams this was treated with sulphuric page 64

136 Potassium Formate Sat. Sol
lots of heat evolved 100 g material on April 2[illegible] at 1.00 P.M. Dissolves Nickel sol green off. April 27, 8.00

137 Sodium Ferrocyanide Sat. Sol
100 g Material on 1.00 P.M. 4/25/14. gets very cold off 4/29/ 8.00 AM

138 Glycero Phosphate of Soda about 75 g. in 200 cc, on 1.00 P.M. 4/25/14 100 g material. Done 4/27/14 9.00 AM off 4/28/ 8.00 AM.

139 Sodium Bromate 100 g Material Sat. Sol. on 1.00 P.M. 4/25/14 gets cold.

140 Para amido benzol sulfonate of Soda 100 grams material Sat. Sol on April 27 2.00 PM done May 1/14 8.00 AM.

141 No proportions L Levoose + NaOH + Material no weight taken. on April 29/14 at 10.00 A.M.

continued on Page 77

Exp. #120 Mar. 20, 14

Mr. Edisons Note Recieved regarding Exp. #120

Will a dilute solution do and how dilute?

Answer

#114 10% Sol Hypo Sulphite of Soda
115 20% Sol " " " "
116 30 " " " "
117 40 " " " "
118 50 " " " "

That is 50g dissolved in 100cc

119 5% Sol Na Sulphite
120 10% " " "
121 15% " " "
122 20% " " "

123 Sat. Sol. Na Hyposulfite
124 Sat. Sol. Na Sulphite.

All on 2 P.M. Mar 20, (Friday) 1914.

Total Time 20 hrs after which all were screened through 10 Mesh and found the following weights remaining on the 10 mesh screen (not not disintegrated.

#114 Left on 10 Mesh Screen (Not disintegrated) 6½g
#115 " " " " " " " 1½g
#116 " " " " " " " 1¾g
#117 " " ——— 1¾g
#118 " " ——— 1¾g

#119 " " ——— 35g
#120 " " ——— 23g
#121 " " ——— 14½g
#122 " " ——— 7½g

Every 24 hrs.
#123 Limes it disintegrates 50g IIIII 5 very slow

#124 Limes it disintegrates 50g III 3rd very slow

This shows the following
1st Hypo Sol. in concentrations, above 10g in 100cc H_2O ~~both work equally~~ well in the same period of time.
2nd that Sulphite works much slower than Hyposulphite.
3rd Hypo working in weaker solutions the

Material can be washed more easily.

Original Sol strongly Neutral,
#123 after 24 hrs filtered off 120 cc sol
Titration 1 cc used .5 cc $\frac{n}{2}$ H_2SO_4
2nd time on 8.30 Mar 23 off Mar 24 / 8.30
105 cc 1 cc used .8 cc $\frac{n}{2}$ H_2SO_4
3rd Mar. 30 8.30 40g

Original Sol
#124 after 24 hrs filtered off 100 cc sol.
Titration 1 cc used 4-5 $\frac{n}{2}$ H_2SO_4
2nd time on 8.30 Mar 23 off [illegible]
85 cc sol 1 cc used [illegible] $\frac{n}{2}$ H_2SO_4
3rd Mar 30 8.30 40g

200 cc H_2O 30 g glycerin 6 g NaOH
Put on hot plate May 6, 930 PM.

Some of the finish saved in evaporating dish

Varnish Plates
Special Plates run May 6, '14
according to following temperatures
Varnish # 632 V-203
on at 2.30
120 at 3,30
130 4,30
140 5,30
150 6,30
166 7,30
170 830
170 for 1 hour 9,30 off.

68 Exp. # 123 Mar 23, 14

Experiment on Varnish
for Disc Records.
100 cc Varnish # 632 + 10 cc Denatured Alcohol,
from Hoffman, + 35 g Lamp Black.
Put in ball mill and rolled at 40–50 Revs per min.
Too thick so I added 100 cc Varnish + 10 cc
Denatured Alcohol. making proportions
200 cc Varnish + 20 cc Denatured alcohol +
35 g Lamp. Black.
Dried over night in air 2 hrs 2" above hot plate
then 2 hrs 1" above then 2 hrs 1/4" above
then 1 hour direct, cooled and stripped

69

Test of Artificial Rubber
for Mr. Hutchinson

Weight of yellow sample # 1 - - - - = 4.6752
Weight after 1 week in regular battery
electrolyte on hot plate @ 120° F =
Difference X
Remarks Sol Pieces pieces entirely disintegrated,
Weight of black sample # 1a - - - - = 5.8218
Weight after 1 week in regular battery
electrolyte on hot plate @ 120° F =
Difference
Remarks Sol. Brown Pieces swells 3/64". Cracked all over
Weight of yellow sample # 2 - - - - = 4.1723
Weight after 1 week in regular battery
electrolyte room temperature 70-80° F =
Difference X
Remarks - Sol Yellow Partly disintegrated about 1/16" deep on surface
Weight of black sample # 2a - - - - = 6.2674
Weight after 1 week in regular battery
electrolyte room temperature 70-80° F. =
Difference -
On Monday Mar. 30 1914 @ 5.00 P.M.
Remarks. Sol Piece of Brown Surface very rough, some cracks. over

Remarks —

When sauced strong odor of Phenol
Boiled with NaOH then precip with acid
and tested with Millons Reagent no
trace of free Phenol. this tends to show
that the substance is Bakelite, or a condensation
product of Phenol probably with Formaldehyd.
Fusing with NaOH prec. with acid then using
Millons Reagent shows Phenol reaction
Boiled with KOH + $KMnO_4$ oxidized to Isolatic Acid
reaction with Resorcin + H_2SO_4
Heated with HNO_3 dilute + Zn Reduced

$$C_6H_5OH + Zn = \underset{\text{Benzole}}{C_6H_6} + O$$

$$C_6H_5OH + Zn + HNO_3 = \underset{\text{Nitrobenzole}}{C_6H_5NO_2} + ZnOH$$

April 29/14

50 cc Water + 10 grams of the various chemicals + 25 grams Nickel Mist from old cells used in all cases except if otherwise specified O = Sol. dissolves completely in 1/2 hour

142 **Ammonium Acetate.** O on 4/29/11.00 P.M.
Sol turns Blue N.G.

143 **Amon. Benzoate** on 4/29/11.00 P.M.
Sol turns blue Done May 2/12.00 Noon

~~143 Ammon. Oxalate~~

144 **Ammon. Oxalate** on 4/29/11.00 PM
Sol turns blue N.G.

145 **Ammon. Sulphate** O on 4/29/11.00 PM
Sol turns Blue N.G.

146 **Ammon. Tartrate** on 4/29/11.00. PM
Sol. turns blue N.G.

147 **Ammon. Citrate** O on 4/29/11.00 PM
Done May 2/12.00 Noon

148 **Ammon. Formate** O 5 grams on 4/29/11.00 PM
Sol turns blue Done May 2/12.00 Noon

149 **Ammon. Hyposulphite** O 6 grams on 4/29 11.00 AM
Sol turns blue, Done May 2/12.00 Noon

150 **Ammon. Nitrate** O on 4/29/11.00 PM
Sol turns blue Done May 6. 11.00 AM

151 **Ammon. Phosphate** O marked Phosphoric
N.G. on 4/29/11.00 P.M.

152 Ammon. Sulphite 0 on 4/29/11.00 PM
Sol. turns blue Done May 2/12.00 Noon
153 Ammon. Hypophosphite 0 on 4/29/11.00 PM
Sol. turns blue aff. May 5, 11.00 A.M.
154 Ferrous Chloride Proto
155 Ferric Chloride 0 on 4/29/11.00 PM
M.G.
156 Lead Nitrate on 4/29/11.00 PM
Sol Med. Green M.G.
157 Lead Acetate on 4/29/11.00 PM.
Sol light green M.G.
158 Calcium Chloride 0 on 4/29/11.00 PM
much flocculent stuff M.G.
159 Calcium Nitrate 0 on 4/29/11.00 PM
M.G.
160 Calcium Acetate on 4/29/11.00 PM
M.G.
161 Calcium Chlorate on 4/29/11.00 PM
M.G.
162 Calcium Citrate on 4/29/11.00 PM
Done May 2/12.00 Noon
163 Chromium Acetate on 4/29/11.00 PM
M.G.
164 Copper Sulphate 0 on 4/29/11.00 PM
M.G.

165 Copper Acetate 0 on 4/29/11.00 PM
M.G.
166 Zinc Sulphate on 4/29/11.00 PM
Sol. Tinge of Green M.G.
167 Zinc Hypophosphite on 4/29/11.00 PM
M.G.
168 Zinc Acetate 0 on 4/29/11.00 PM
Sol. Tinge of green M.G.
169 Magnesium Acetate on 4/29/11.00 PM
M.G.
170 Mag. Chloride 0 on 4/29/11.00 PM
Much flocculent green ppt. M.G.
171 Mag. Nitrate 0 on 4/29/11.00 PM
M.G.
172 Mag. Hyposulphite 0 on 4/29/11.00 PM
aff May 6, @ 11.00 AM
173 Mag. Sulphate 0 on 4/29/11.00 PM
M.G.
174 Acetanilid on 4/29/11.00 P.M.
Soluble in 194 pts Water M.G.
175 Sodium Benzoate 0 on 4/29/11.00 PM
M.G.
176 Acid Hydrofluric 10% 0 on 4/30/4 PM
M.G.
177 Para Amido Phenol 10% on 4/30/4 PM
5 grms M.G.

178 Chromium Nitrate O on 4/30/4 PM
M-G.

179 Copper Nitrate O on 4/30/4 P.M.
M-G.

180 Zinc Nitrate O on 4/30/4 P.M.
Sol. Light Green M-G.

181 Magnesium Citrate O on 4/30/4 PM
Off May 6, 11.00 A.M.

182 Magnesium Fluoride on 4/30/4 PM
M-G.

183 Magnesium Phosphate on 4/30/4PM
M-G.

184 Magnesium Sulphite on 4/30/4 P.M.
M-G.

185

186

187 Page 92

#143 Dissolves some Nickel (sol. green after adding ammonia why not blue?

#148 Sol very blue after adding ammonia much Nickel dissolved.

#149 Sol very blue after adding ammonia much nickel dissolved.

#147 Sol nearly black much fines or precipitate. fines go through filter paper in washing.

#152 Sol very blue after adding ammonia much Nickel dissolved

162 Sol Red. Much fines or precip.
7 times go through filter paper in washing

153 Wash Water green dissolving Nickel

May. 8, 12.00 Night.
Experiment to see if the following things are attacked by the Na. Hyposulphite Solution
Sol. 30 g Hypo in 100 cc H_2O.
Off May. 11. 12.00 Noon
Copper Sol contains a prec. Prec filtered off
Precip consists of } attacks the copper
Filtrate contains } prec with H_2S

Iron Sol contains a precip. Iron turns black
Prec. Filtered off. Filtrate contains
Dissolves the iron which is prec. out as Hydrate (red by oxid)
Precip consists of
Wood (Pine)

Analysis of Polish for
Mr. Pusard.

5 cc Borax Lösung 0.2 g
Top layer 30 cc Bottom layer 15 cc
100 cc enthalten 4 Gramm Silicate

Dem unteren Schicht. Niederschlag
4 – 1 ausgeglüht mit Porzellan @ 20° C
Wasser @ 20° C .04
X @ 20° C .16 "
Sp. G. @ 20° C = 0.8594

Total Glas + 5 wasser + öl = 18.4346
— 5 wasser = .5.0000
Gemischtes Glas + öl 13.4346
— Glas 9.1373
Gewicht von öl 4.2973 | 5
40 .8594 Sp. G.
29
25
47
45
23
20

Verseifungs Zahl.

Glas + öl = 46.9078
Glas = 45.8882
öl =

No Saponification Figure

Iodine Figure

Blanken Versuch 37.8 cc 1/10 Thiosulfat
Lösung verbraucht
37.8 – 27.0 = 11.5 Thiosulfat entsprechend
Jod absorbiert:
1 cc 1/10 Thiosulfat Lösung = 0.0128 J
.0128 × 16.45 = .21056 J
.21 × 11.5 / 16.45 = 0.1468

550943
54.2245
.8698 g

.1468 × 100 / .8698 = 16.88 Jodzahl.

16.88
Zusammen

Ein hundert cc. Alkohol mit Fünf Gramm Schellac und 25-50 cc Mineral Öl dazu eingehen 5 Tropfen Oleum Bergamotti

187 100 cc H_2O 5g Glucose Anhydrous + 3g NaOH
188 " " " 10 " " " " "
189 " " " 15 " " " " "
190 " " " 20 " " " " "
All on 10.00 A.M. May 1st/14.
Hot Plate - 50g Material

191 100 Water 5g Sugar of Milk 50g Material
192 " " 10 " " " "
193 " " 15 " " " "
194 " " 20 " " " "
On Hot Plate @ 5.30 PM May 5/14.
Off May 12/ 8.00 AM Refl some samples

195 100 Water 5g Cane Sugar 5.0g. Material
196 " " 10 " " " "
197 " " 15 " " " "
198 " " 20 " " " "
On hot Plate @ 5.30 PM May 5/14. Off May 12/8.00 AM Refl some Samples

Cold

199 50 cc Water 5g Chlorogen 25g Material
on May 5 2.30 PM
N.G.

200 50 cc Water 5g Hydrochinone 25g Material
on May 5 2.30 PM off May 7, 2.30 PM

201 50 cc Water 5g Metol 25g Material
on May 5. 2.30 PM
N.G.

202 50 cc Water 5g Glycin 25g Material
on May 5, 2.30 PM N.G.

203 50 cc Water 5g Ferrous Sulphate 25g Material
on May 5 2.30 PM N.G.

204 50 cc Water 5g Acid Pyrogallic 25g Material
on May 5 2.30 PM
off May 7 2.30 PM

205 50 cc Water 5g Metol 25g Material
Gases a little after material put in on May 5, 2.30 PM
M-G.

206 50 cc Water 5g Hydroxylamine Hydrochloride 25g Material
Gases a great deal after material put in
on May 5, 2.30 P.M., Gets slightly warm Sol Green
off May 7, 2.00 PM Reduces to Green

207 50 cc Water 5g Hydrazine Sulphate 25g Water
Gases quite a little after material put in
on May 5, 2.30 P.M. Sol. Green M-G.

208 50 cc 40% Formaldehyde 25g Material
Gases quite a little after material put in
on May 5, 2.30 P.M. Temp Rises to 115°F
off May 7

209 50 Water 5g Iron Oxalate ( ) 25 Mat—
on May 6 11.00 AM M-G.

210 50 Water 5g Iron Ammon Oxalate (Ferric)
25g Material. on May 6 11.00 AM M-G.

211 50 Water 5g Iron Sod. Oxalate (Ferric)
25g Material on May 6. 11.00 AM M-G.

212 50 g Material in 100 cc Distilled
water on hot plate May 6, 10.30 AM
M-G

213 50 cc H_2O 10g Ferrous Bromide 50g Material
on May 6, 4.30 P.M. M-G.

59 a. OTT Big Batch of 5 lbs Broken Tubes
4000 cc H_2O 1200 g Na Hyposulphite
White on May 7, 11.15 A.M.
off May 8, 9.15 AM Total
Time 22 Hours. About 2 grams
of Solid Lumps Not dissolved and
about 10 grams of Flake Hammered together
so hard that it was not separated and would
not pass through an 8 mesh screen
This solution has a Sp. G. of 1138 at
13° C this corresponds to 25% Sol. $Na_2S_2O_3$
$5H_2O$. Used the same kind that the Photo Supply
buys in Barrel Lots. This Hypo
when dissolved must be filtered before
it is used as it contains quite a little
wood from the barrel.

Big Batch of 10 lbs same proportions
as above on May 21, 14 at 9.05 A.M.
off Wed. June 3 at 8.30 A.M. saved 2 1/2 liters

96

Nos: 214 – 336 inclusive 100 grams drum in Saturated Sol, of the following salts.
All ~~[illegible]~~ saturated with the salt unless otherwise specified

OTT 214 K. Carbonate on 5/13/ 2 PM off 5/20/14.
Sol very clear ✓

From 214 to 336 incl. off 5/20/14 at 10 a.m.

OTT 215 K. Bichromate 5/13/2 PM off 5/20/15
Much effluent Oxide Ferric ✓

OTT 216 K. Oxalate 5/13/2 PM ✓
Some effluent Ferric Oxide

OTT 217 K. Perchlorate 5/13/2 PM ✓
Sol clear

OTT 218 K. Arsenite. 5/13/2 PM
Sol yellow

OTT 219 K. Benzoate 5/13/2 PM ✓
Sol clear hard to wash

OTT 220 K. Chlorate 5/13/2. PM ✓
Sol clear hard to wash

97

OTT 221 K. Sulphite 5/13/2 PM ✓
Sol clear Hard to wash.

OTT 222 K. Cyanide 5/13/2 PM ✓
Sol Brown Hard to wash.

OTT 223 K. Phosphate 5/13/2 PM ✓
Sol clear

OTT 224 Hydrosulphite (Bacheiche) 5/13/2 PM ✓
Sol clear Hard to wash. Dried very rusty.

OTT 225 K. Bitartrate 5/13/2 PM ✓
Sol very black Hard to wash. Dried a little rusty.

OTT 226 K. Nitrite 5/13/2 PM ✓
Sol clear

OTT 227 K. Chloride 5/13/2 PM ✓
Sol clear

OTT 228 K. Al. Sulphate 5/13/2PM ✓
Much efflorescd Ferric Oxide

OTT 229 K. Iodide 5/13/2PM ✓
Sol clear

OTT 230 K. Permanganate 5/13/2PM ✓
Some efflorescd Ferric Oxide

OTT 231 K. Bisulphate 5/13/2PM ✓
Some efflorescd Ferric Oxide Sol slightly green.

OTT 232 K. Ferrocyanide 5/13/2PM ✓
Sol clear 1% KOH then washed again with H_2O

OTT 233 K. Sulphide 5/13/2PM ✓
Sol clear 1% KOH Washed again H_2O

OTT 234 K. Manganate 5/13/2PM ✓
Some efflorescd Ferric Oxide 1% KOH then washed again

OTT 235 K. Hyposulphite 5/13/2PM ✓
Sol clear 1% KOH then Washed again

OTT 236 K Chromate ✓ 5/13/2PM
Sol clear 1% KOH then washed again

237 — 297 all off June 8, 14. 3 PM
6/2/14 - 3 p.m.

OTT 237 K. Arsenate ✓✓
Sol clear but precip of green flocks. during washing these flocks appear white looks like Aluminum Hydroxide -

OTT 238 K. Bromate ✓✓ 15 gr. 6/2/14 - 3 p.m.
Sol clear some flocks rusty

OTT 239 K. Binoxalate ✓✓ 15 gr. 6/2/14 - 3 p.m.
Sol yellow. muddy.

OTT 240 K. Hypophosphorous ✓✓ 10 gr. 6/2/14 - 3 P.M.
Sol muddy.

OTT 241 K. Propionate ✓✓ 6/2/14 / 3 PM
Sol clear

Y 5.72

OTT 242 K. Ferricyanide ✓ 6/2/14 - 3. p. m.
Sol clear. (no mudd)

OTT 243 K. Lactate

OTT 244 K. Ethyl sulphate ✓ not taken

OTT 245 K. Persulphate ✓ 10 gr. 6/2/14 - 3. p. m.
Sol clear, much flocculent brown on top of the iron

OTT 246 K. Ethylsulphonate ✓ 6/2/14 - 3. p. m.
Sol clear base of flocculent brown on iron

OTT 247 K. Carbolate not taken

OTT 248 K. Formate ✓✓ 6/2/14 - 3. p. m.
Sol clear

5.5 1

OTT 249 K. Urate ✓✓ 10 gr. 6/2/14 - 3. p. m.
Sol clear

250 K. Citrate ✓✓ 6/2/14 - 3. p. m.
Sol clear

OTT 251 K. Salicylate ✓ 6/2/14 3. p. m.
Sol clear.

OTT 252 K. Chloro Chromate ✓✓ 6/2/14 - 3. p. m.
Full of Ferric Oxide. Hard to wash

OTT 253 K Lacto Phosphate not taken

T 254 K. Sulphethylate not taken

OTT 255 K. Metaborate ✓✓ 6/2/14 - 3. p. m
Sol. clear

256 K. Sulfocyanate ✓✓ 10 gr. 6/2/14 3. p. m.
Sol clear

OTT 257 K. Ethylsulphuric ✓✓ 10 gr. 6/2/14 3 p.m.
Ferric swimming on top of Sol.

OTT 258 K. Percarbonate ✓ not taken

OTT 259 Rochelle Salts Seignette Salts ✓✓ 6/2/14 3 P.m.
Some Green Flocks

OTT 260 K. Bromide ✓✓ 6/2/14 3 PM
Sol. Clear

OTT 261 K. Valerianate

OTT 262 K. Cyanate ✓✓ 6/2/14 3 PM
Sol slightly green smells of Ammonia

OTT 263 K. Tannate ✓✓ 60 gr. 6/2/14 3 PM

OTT 264 K. Benzene Disulfonate ~ not taken

OTT 265 K. Sulfobenzoate ✓✓ 10 gr. 6/2/14 3 PM
Trace of Ferric on top of the iron

OTT 266 K. Ferric Oxalate ✓✓ 6/2/14 3 PM
Much Ferric on top of the iron.

OTT 267 Sodium Bicarbonate ✓✓ 6/3/14 4 PM
Sol clear.

OTT 268 Na Acetate ✓✓ 6/3/14 4 PM
Sol clear

OTT 269 Na Cyanide ✓✓ 6/3/14 4 PM
Sol clear color Brown

OTT 270 Na Oxalate ✓ 6/3/14 4 PM
Sol. clear.

OTT 271 Na. Ammon. Phosphate ✓ 6/3/14 4 PM
Sol. clear.

OTT 272 Na. Hyposulphite ✓ 6/3/14 4 PM
Sol. clear, some ferric on top of the iron

OTT 273 Na. Bromide ✓ 6/3/14 4 PM
Sol. clear some ferric on top of the iron.

OTT 274 Na. Arseniate ✓ 6/3/14 4 PM
Sol clear

OTT 275 Na. Phosphate ✓ 6/3/14 4 PM
Sol clear

OTT 276 Na. Phenylate ✓ 6/3/14 4 PM

OTT 277 Na. Sulphite ✓ 6/3/14 4 PM.
Sol clear

OTT 278 Na. Benzoic ✓ 6/3/14 4 PM
Sol clear

OTT 279 Na. Carbonate ✓ 6/3/14 4 PM.
sol clear

OTT 280 Na. Sulphide ✓ 6/3/14 4 PM
Sol yellow red spots on some fragments.

OTT 281 Na. Chloride ✓ 6/3/14 4 PM
Sol clear some ferric on top of the iron.

OTT 282 Na. Bisulphate ✓ 6/3/14 4 PM
Sol a little gassing

OTT 283 Na. Borate ✓ 6/3/14 4 PM
Sol clear

284 Na. Salicylate ✓ 6/3/14 4PM
Sol clear

285 Na. Nitrite ✓✓ 6/3/14 4PM
Sol clear

286 Na Phosphite ✓✓ 6/3/14 4PM
Sol. clear

287 Na. Silico Fluoride ✓✓ 6/3/14 4PM
Sol. not clear white flocks

288 Na. Bi phosphate ✓✓ 6/3/14 4PM
Ends a little gassing. Sol. not clear much white flocks.

289 Na. Fluoride ✓✓ 6/3/14 4PM
Sol. clear

290 Na. Tartrate ✓✓ 6/3/14 4PM
Sol clear

291 Na. Manganate ✓✓ 6/3/14 4PM
Sol seems to keep green

292 Na. Chromate ✓✓ 6/3/14 4PM
Sol clear

293 Na. Stannate ✓✓ 6/3/14 4PM
Sol unclear much white flakes

294 Na Sulfocarbonate ✓✓ 6/3/14 4PM

295 Na. Peroxide ✓✓ 6/3/14 4PM
Violent action! (10 grams) Sol clear

296 Na. Butyric ✓✓ 6/3/14 4PM
Sol clear much Ferric on the iron.

297 Na. Bichromate ✓✓ 6/3/14 4PM
Sol-clear X

298 to 325 incl on July 7, '14 at 11.00 AM.

298 Na. Urate 10 gr.

299 Na. Phosphate (Tribasic) 20 gr.

300 Na. Benzene Sulphonate 8 gr.

301 Na. Phosphotungstate

302 Na. Ceminate 5 gr.

303 Na. Tungstate 20 gr.

304 Na. Lactate

305 Na. Stibic 30 gr.

306 Na. Benzoate 5 gr.

307 Na. & Mag. Sulphate 20 gr.

308 Na. Sulphanilate 20 gr.

309 Na. Sub-benzoate

310 Na. Cholate 10 gr.

311 Na. Valerianate

312 Na. Sulph ethylate 5 gr. ✓

313 Na. aluminate

314 Na. Sulphovinate 10 gr. ✓

315 Na. Biborate 8 gr. ✓

316 Na. & K. Sulphate

317 Na. Citartrate ✓

318 Na. Ferrocyanide 20 gr. ✓

319 Na Tannate 5 gr.

320 Na. Tetra oxalate

321. Na. Persulphate 5 gr. ✓

322 Na. Bismuthate 10 gr. ✓

323 Na. Bromate

324 Na. Glycerophosphate

325 Na. Bromate. ✗ not sufficient

~~2.36~~ 3.26 Hydrogen Peroxide

327 Copper Nickel Flake (Books) in
100cc H_2O + 30g Na Hyposulfite on
May 11, at 4.P.M. 10 grams Material.
Copper only turns black N.G. for Seperating.

328. Same as #327 except put on } N.G.
Cot plate May 11, at 4 P.M. } for seperating.

Soft Rubber, Hard Rubber Tin
Zinc, Lead Brass, Wood (Pine)
all in 20% Na. Hyposulfite Sol.
in corked bottles May 16, at 9.00 A.M.
Notes on May 19, 1914 Tuesday
Hard Rubber looks tarnished.
Tin Some Brown Spots also brown flakes floating
in the solution.
Zinc Great deal of White precipitate.
Lead Quite a few brown flakes in the solution.
Brass Black spots on polished side a
little white precip. in sol.

Note on the irons from # 214 to 325 incl.
Three 50 mesh. add 10% new 7c Mix
with regular Hg O & make 7 gram pockets
no Hg in the old Iron but reg Hg in the
10% Extra you add — E. Telephoned
to Silver Lake Mr. Hunter June 6, 1914.

Changed to Iron 60 mesh
Then changed [illegible]
the lot from #237 to 297 to Iron 100 mesh

Same as Nos 214 ect. Sat Sol of following salts, 100 g Fe.

329 Ammon Sulphite

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Varnish Plates

Thick Plates

Exp. No. 1 Varnish 632 — 203

1 hour to 120
1 " " 130
1 " " 140
1 " " 150
1 " " 160
1 " " 170
kept 1 " at 170

Thick Plates

Exp. No 2 Varnish 632 Lot.

1 hour to 120
1 " " 130
1 " " 140
1 " " 150
1 " " 160
1 " " 170
1 " " 180
kept 1 " at 180

Exp. No 3. Thick Plates

1 hour to 120
1 " " 130
1 " " 140
1 " " 150
1 " " 160
1 " " 170
1 " " 180
2 hours at 180

Exp. # 4 Varnish on Reg. Powder Blanks in oven at. 8.30
115 degrees at 9.00 kept at 115°F. May 13 th
Lot Plate taken out 4.30 P.M.
Rest out at 12 Noon May 14 th

2 Hard 6/4 Blanks covered with varnish Run same Schedule as Exp. No 1.

May 16 Saturday
3 6/4 Hard Blanks Varnished heated at 120°F, on May 16 at 8.00 AM off 5.30 P.M. one taken out Monday Morning restarted Monday at 8.30 A.M. same temperature rest taken out at 1.30 P.M. Monday.

Monday May 18 at 10:40 AM one big plate in same oven top shelf to be run same as those of May 16, at 120 °F.
Same date another ~~big~~ plate in 10,50 Bottom Shelf

2 Plates in at 1.30 PM Middle shelf
Monday May. 18 all off 5.30

All on again May 19 9.00 A.M.

Big Oven
Some plates set flat in by Mr. Moore with Lime marked on each tag. This oven has been running constantly up to May 20/14 at 4.00 PM when it was shut off

Hexametaphosphate of Soda
NaOH Solution was neutralized with Syrupy
Phosphoric Acid (slight excess of Acid) then
Evaporated to dryness, then fused.

Record of Lead Cells in Mr Hutchinsons Cadillac Car.

Nov. 24, 13.

Cells Numbered 1, 2, 3. #1 being the cell nearest the front or engine end of car.

All Sp. G. figured for 15° C.

#1 Sp. G.	1250	V open	2.1	V closed	2.05
#2 " "	1250	V open	2.1	V "	2.05
#3 " "	1250	V open	2.1	V "	2.05

V closed = all lights out.

May 16/14

Made some Nickel Ortho Phosphate by Precipitating 8.4 g $NiSO_4$ with 7.1 g Na_2HPO_4

$$2\,Na_2HPO_4 + 3\,NiSO_4 + 7H_2O = Ni_3P_2O_8\,7H_2O + 2\,Na_2SO_4$$

Washed until $BaCl$ showed no more trace of Sulphates then dried in air.

Took some of the Ni Phosphate (ortho) and Put it in 20% Na OH boiled (excess of Soda) then filtered and washed until free of Sulphates and also no more reaction with Phenylphthalein. The Na OH was converted to Sodium Phosphate. The Nickel Hydrate left on the filter was then dissolved in $HCl + HNO_3$ ammonia added and filtered then added Magnesia Mixture some phosphates were precipitated showing that the conversion was not complete that is the Na OH retained some of the phosphoric acid radical probably as a Nickel Phosphate insoluble in Na OH.

Made Nickel Di Meta Phosphate by dissolving Ni_2O_3 in H_3PO_4 Nickel in excess filtering then heating to 316°C.

Made Nickel Aluminate by precipitating $NiSO_4$ with a Solution of Na OH nearly saturated with Aluminum washed free of Sulphates then dried. Tested the precipitate by dissolving in HCl adding ammonia precip of much Alumina.